

What is claimed is:

[1] A method for producing a catalyst having a composition represented by the following formula (1) for use in producing methacrylic acid through gas-phase catalytic oxidation of methacrolein with molecular oxygen, comprising the steps of:

- (i) preparing a solution or slurry containing at least molybdenum, phosphorus, and vanadium (liquid I);
- (ii) preparing a solution or slurry containing ammonium radical (liquid II);
- (iii) preparing a mixture of the liquid I and the liquid II by introducing one liquid (liquid PR) of the liquid I and the liquid II into a tank (tank A) and pouring the other liquid (liquid LA) on a continuous region in the surface of the liquid PR, the continuous region occupying 0.01 to 10% of the whole area of the surface of the liquid PR; and
- (iv) drying and calcining the resultant solution or slurry containing a catalyst precursor comprising all the catalyst constituents,



wherein P, Mo, V, Cu and O represent phosphorous, molybdenum, vanadium, copper and oxygen, respectively; X represents at least one element selected from the group consisting of antimony, bismuth, arsenic, germanium, zirconium, tellurium, silver, selenium, silicon, tungsten and boron; Y represents at least one element selected from the group consisting of iron, zinc, chromium, magnesium, tantalum, cobalt, manganese, barium, gallium, cerium and lanthanum; Z represents at least one element selected from the group consisting of potassium, rubidium and cesium; and subscripts a, b, c, d, e, f, g and h represent an atomic ratio of each element, respectively; when b is 12, a is in the range of from 0.5 to 3, c is in the range of from 0.01 to 3, d is in the range of from 0.01

to 2, e is in the range of from 0 to 3, f is in the range of from 0 to 3, g is in the range of from 0.01 to 3 and h represents the atomic ratio of oxygen necessary for fulfilling the requirement of the valence of each element above.

[2] The method for producing the catalyst for use in producing methacrylic acid according to claim 1, wherein the liquid LA is poured while stirring the liquid PR introduced into the tank A with a stirring power of 0.01 to 3.5 kW/m³.

[3] The method for producing the catalyst for use in producing methacrylic acid according to claim 1 or claim 2, wherein the liquid LA is poured from the height of 0.05 to 2 m above the surface of the liquid PR introduced into the tank A.

[4] A catalyst produced by the method according to claim 1.

[5] A catalyst produced by the method according to claim 2.

[6] A catalyst produced by the method according to claim 3.

[7] A method for producing methacrylic acid through gas-phase catalytic oxidation of methacrolein with molecular oxygen in the presence of the catalyst according to claim 4.

[8] A method for producing methacrylic acid through gas-phase catalytic oxidation of methacrolein with molecular oxygen in the presence of the catalyst according to claim 5.

[9] A method for producing methacrylic acid through gas-phase catalytic oxidation of methacrolein with molecular oxygen in the presence of the catalyst according to claim 6.